Comments Received for RTAC
3-27-09 thru 4-27-09

COMMENT LOG DISPLAY

BELOW IS THE COMMENT YOU SELECTED TO DISPLAY.
COMMENT 6 FOR COMMENTS ON THE RTAC (SB375-RTAC-WS) - 1ST WORKSHOP.

First Name: Malcolm
Last Name: Gaffney
Email Address: malgaff@gmail.com
Phone Number: 6612881501
Affiliation:

Subject: sb375-rtac-ws
Comment:

Please pass this piece of legislation.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2009-04-03 12:52:01

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COMMENT 7 FOR COMMENTS ON THE RTAC (SB375-RTAC-WS) - 1ST WORKSHOP.

First Name: Dan
Last Name: Wayne
Email Address: dwayne@co.shasta.ca.us
Phone Number:
Affiliation: Shasta County RTPA

Subject: RTAC comments
Comment:

Please see attached message which was originally sent as an email to ARB staff

Attachment: www.arb.ca.gov/lists/sb375-rtac-ws/24-comments.pdf

Original File Name: Comments.pdf

Date and Time Comment Was Submitted: 2009-04-14 15:07:10

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From: Dan Wayne [mailto:dwayne@co.shasta.ca.us]
Sent: Wednesday, April 08, 2009 9:38 AM
To: Ito, Doug@ARB
Cc: Mike McKeever
Subject: RTAC Comments

Doug,

Once the RTAC process is completed – but before the final report to the ARB – something I hope you will consider is a process/book called "Assumption-Based Planning" (James A. Dewar). I'm seeing a lot of explicit (e.g. documented) assumptions being built into the process, as well as a great many implicit assumptions (e.g. uncertainties that are hidden/buried in the process without consciously examining them). Many of the latter assumptions will be load-bearing (e.g. regional targets will likely fail without these assumptions coming true) and extremely vulnerable to a myriad of future events/factors.

If these assumptions are daylighted early enough, much can be done to manage the vulnerability of such assumptions. Hedging actions may also be identified and incorporated into the planning process in order to help insure our ambitious targets remain achievable over time. I believe the long-term success of this effort depends upon it.

Also, thanks to all involved who have made the RTAC process so accessible. The video webcast worked very well and online access to materials has been excellent.

Best regards,

Daniel Wayne

Senior Planner

Shasta County Regional Transportation Planning Agency

1855 Placer St.

Redding, CA 96001-1759

Phone: (530) 225-5486

Fax: (530) 225-5667

Email: dwayne@co.shasta.ca.us

COMMENT LOG DISPLAY

BELOW IS THE COMMENT YOU SELECTED TO DISPLAY.
COMMENT 8 FOR COMMENTS ON THE RTAC (SB375-RTAC-WS) - 1ST WORKSHOP.

First Name: Linda
Last Name: Wheaton
Email Address: Lwheaton@hcd.ca.gov
Phone Number:
Affiliation: HCD

Subject: JHB bibliography
Comment:

Doug, et. al.:

Below for your information is the link to HCD's latest update of an electronic bibliography on JHB issues. . . it includes the work done on this issue by the MPOs and others for the Inter-Regional Partnerships (IRP) Program in the earlier part of the decade (link excerpted below). The IRP Program was a forerunner of the Regional Blueprint Program.

Jobs-housing balance resources // Issues related to the spatial relationship between the location of jobs and housing have posed a persistent planning challenge for some time. This bibliography includes the work of researchers and planning practitioners in tackling these issues which are found to defy "one-size-fits-all" prescriptions. Planning for and attaining an adequate supply of housing located within a reasonable commute distance of compatible employment opportunities for the workforce involves complex relationships.

http://www.hcd.ca.gov/hpd/jobshousing.pdf

CALIFORNIA'S INTER-REGIONAL PARTNERSHIP PROGRAM: Jobs, housing, and mobility strategies / Wheaton, Linda, ed. -- Sacramento, CA: California Department of Housing and Community Development, 2005, 232 p.

Available full text via the World Wide Web:
http://www.hcd.ca.gov/hpd/irp/irp112105.pdf

"This report describes and evaluates the California Inter-Regional Partnership (IRP) Program as of 2004, and also includes a literature review of jobs-housing relationships. The purpose of the IRP Program was to 'encourage state land-use patterns that balance the location of employment-generating uses so that employment-related commuting is minimized,' and to provide a forum for some of the State's most impacted regions to deal collaboratively on issues regarding jobs, housing, and

transportation. ...This report includes an overview of the IRP Program, evaluates issues relating to jobs-housing relationships, summarizes lessons from the IRP projects, and includes highlights of the summary reports of each of the eight IRPs funded by the program.... The report ddvises there is no 'one size fits all' prescription for these issues; it is necessary to evaluate each context to identify appropriate strategies. ..." (ps. ES-1, 18)

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2009-04-24 13:57:16

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COMMENT 9 FOR COMMENTS ON THE RTAC (SB375-RTAC-WS) - 1ST WORKSHOP.

First Name: Joe
Last Name: Distefano
Email Address: JoeD@calthorpe.com
Phone Number:
Affiliation: Calthorpe Associates

Subject: Vision California
Comment:

Vision California Regional Demographic Summary Map transmitted to ARB via email on April 21, 2009

Attachment: www.arb.ca.gov/lists/sb375-rtac-ws/27-vision_ca_regional_demographic_summary_map.pdf

Original File Name: Vision CA Regional Demographic Summary Map.pdf

Date and Time Comment Was Submitted: 2009-04-27 10:03:08

If you have any questions or comments please contact Office of the Ombudsman at (916) 327-1266.

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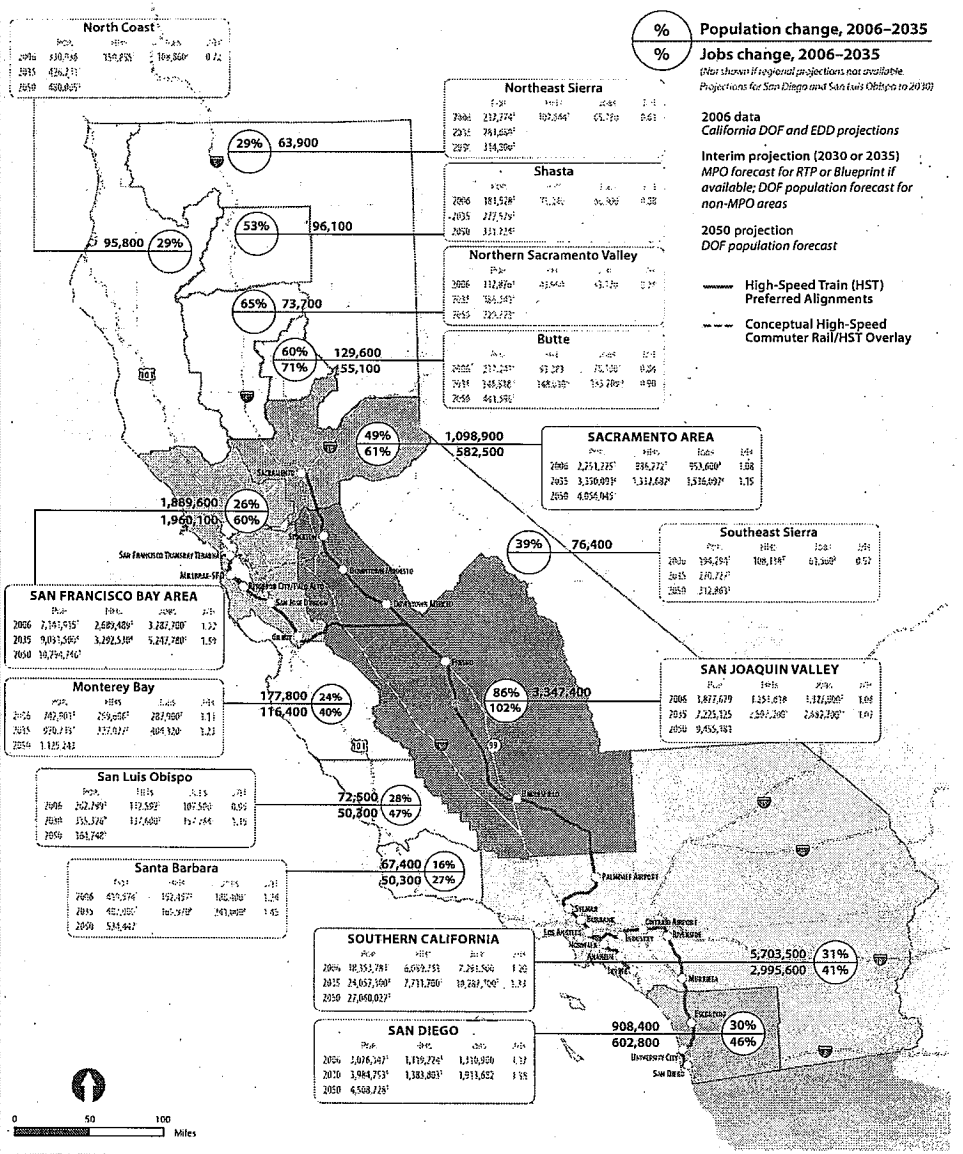
Regional Demographic Summary

VISION CALIFORNIA

CALTHORPE



% Population change, 2006–2035

% Jobs change, 2006–2035

Data shown if regional projections not available. Projections for San Diego and San Luis Obispo to 2030

2006 data
California DOF and EDD projections

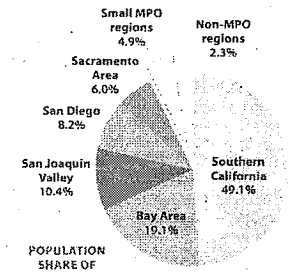
Interim projection (2030 or 2035)
MPO forecast for RTP or Blueprint if available; DOF population forecast for non-MPO areas

2050 projection
DOF population forecast

High-Speed Train (HST) Preferred Alignments

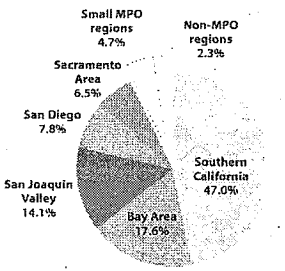
Conceptual High-Speed Commuter Rail/HST Overlay

REGIONAL POPULATION SHIFTS

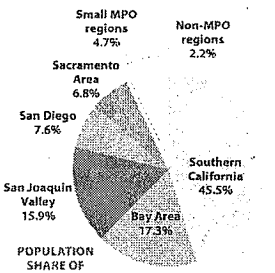


POPULATION SHARE OF MAJOR MPOs
92.8%

2006[1]
37.4 million total



2035[1,3-10]
51.2 million total

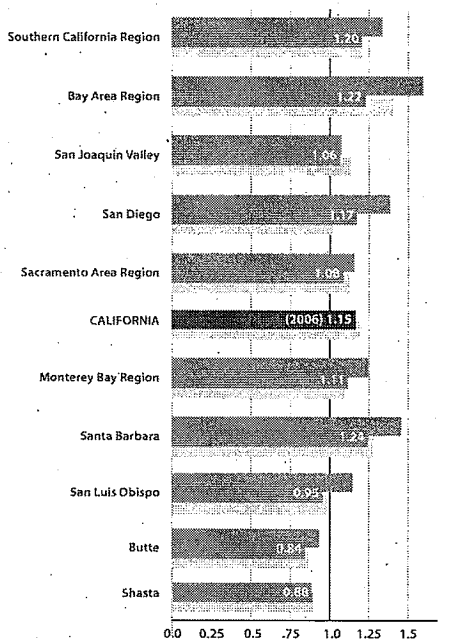


POPULATION SHARE OF MAJOR MPOs
93.0%

2050[1]
59.5 million total

JOBS/HOUSING BALANCE BY REGION

MPO Regions (by population size)

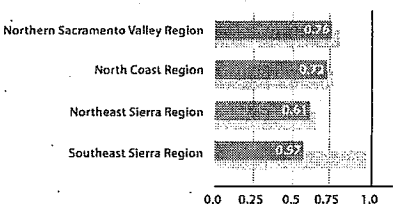


Projected (2030 or 2035)
2006[1]

Based on regional growth forecasts; not shown if not available

Jobs/housing balance =
Total jobs / Total housing units

Non-MPO Regions (by population size)



SOURCES:
[1] CA DOF
[2] CA EDD
[3] SCAG 2008 Regional Growth Forecast
[4] AMBAG Projections 2007
[5] SANDAG 2030 Regional Growth Forecast Update, 2006
[6] SACOG 2035 Regional Growth Forecast, 2005
[7] AMBAG 2035 Regional Growth Forecast, 2008
[8] SBCAG 2040 Regional Growth Forecast, 2007
[9] SLOCOG 2030 Long-Range Socio-Economic Projections, 2006
[10] SCAG 2035 RTP Regional Growth Projections, 2008
[11] San Joaquin Valley Blueprint, 2008

COMMENT LOG DISPLAY

BELOW IS THE COMMENT YOU SELECTED TO DISPLAY.
COMMENT 10 FOR COMMENTS ON THE RTAC (SB375-RTAC-WS) - 1ST WORKSHOP.

First Name: Dan
Last Name: Sperling
Email Address: dsperling@ucdavis.edu
Phone Number:
Affiliation:

Subject: New Brookings Institution Report on Sustainable Transport
Comment:

Brookings Institution Report transmitted to ARB via email on April 18, 2009

Attachment: www.arb.ca.gov/lists/sb375-rtac-ws/28-bi_germany_transportation_report.pdf

Original File Name: BI_germany_transportation_report.pdf

Date and Time Comment Was Submitted: 2009-04-27 10:08:44

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Metropolitan Policy Program
at BROOKINGS

Making Transportation Sustainable: Insights from Germany

Ralph Buehler, John Pucher, and Uwe Kunert[1]

Prepared for the Brookings Institution Metropolitan Policy Program

April 2009

EXECUTIVE SUMMARY

Worsening traffic congestion and increasing reliance on foreign oil affect America's economic competitiveness. Excessive driving contributes to high energy consumption, carbon emissions, and pollution. The costs of maintaining the current structure are untenable. The existing gas tax cannot finance the massive investments needed to fix our deteriorating transportation system.

Increasing transportation sustainability in the United States requires policies that foster changes in travel behavior. Germany's case may provide a helpful example. Although car use has grown in both countries, Germany has been far more successful than the United States in creating a more balanced transportation system.

Sustainability, for the purposes of this report, means encouraging shorter trips by modes of transportation that require less energy and generate less harmful environmental impacts. Moreover, a more sustainable transportation system should foster commerce, reduce energy consumption and carbon emissions, increase safety, provide equal access to destinations for all groups of society, and enhance the quality of life.

America's challenge

This report examines the key differences and determinants of travel behavior in Germany and the United States. Americans travel by car twice as much per year as Germans and use transit only a sixth as much. Differences in car reliance between the United States and Germany are not solely due to income or residential density. Germans in the *highest* income quartile make a lower share of their trips by car than Americans in the *lowest* income quartile. And Germans living in low density areas travel by car about as much as Americans living at population densities five times higher.

The result is a transportation system in the United States that is less sustainable than in Germany. The per capita carbon footprint of passenger transportation in the United States is about three times larger than in Germany. Although gas prices in the United States are half those in Germany, Americans spend five percent more of their budgets on transportation than Germans. In government outlays as well (federal, state and local), Germany spends less per capita on transportation than the United States.

German policies

German governments at all levels have influenced travel behavior through a series of policies enacted over decades. Pricing, restrictions, and mandated technological improvements help mitigate the harmful impacts of car use. Integration of public transportation at the metropolitan and national levels provide a viable alternative to the car. Targeted regional land planning policies encourage compact, mixed-use development, and thus keep trip distances short and feasible for walking or cycling. These policies were coordinated to ensure their mutually reinforcing impact.

Lessons for the United States

Public policy can play a major role in reshaping America's transportation system. The German experience offers five lessons to the United States for improving transportation sustainability through changes in travel behavior:

1. ***Get the Price Right*** in order to encourage the use of less polluting cars, driving at non-peak hours and more use of public transportation
2. ***Integrate Transit, Cycling, and Walking as Viable Alternatives to the Car***, as a necessary measure to make any sort of car-restrictive measures publicly and politically feasible
3. ***Fully Coordinate and Integrate Planning for Land Use and Transportation*** to discourage car-dependent sprawl and promote transit-oriented development
4. ***Public Information and Education to Make Changes Feasible*** are essential in conveying the benefits of more sustainable policies and enforcing their results over the long term
5. ***Implement Policies in Stages with a Long Term Perspective*** because it takes considerable time to gather the necessary public and political support and to develop appropriate measures.

A New Federal Approach

A window of opportunity for changes in transportation policy is opening in the United States. There is an impending transportation funding crisis, a deep recession, highly volatile energy prices, and imminent U.S. engagement in international climate change discussions. Moreover, the next update of the federal transportation law is due in the fall of 2009.

These opportunities require political commitment from Congress and the White House to a new set of federal policies. The focus should be on investing in infrastructure that supports the competitiveness and environmental sustainability of the nation, rather than funding unworthy pork barrel projects of individual states or districts. This will require a level playing field between all modes and a firm commitment to integrating transportation, land use, housing, and economic development plans in order to serve the projected growth over the next several decades.

I. INTRODUCTION

Long before climate change became a leading topic, countries in Western Europe and North America recognized the need to mitigate the negative impacts of their transportation systems.[2] This issue has become a policy priority in many countries, with the widely reached consensus on the role of greenhouse gases in climate change. Most countries are far from achieving the goal of transportation sustainability currently, with the United States often cited as one of the worst examples.

Sustainability, for the purposes of this report, means encouraging shorter trips by modes of transportation that require less energy and cause less environmental harm. Moreover, a more sustainable transportation system should foster commerce, reduce energy consumption and carbon emissions, increase safety, provide equal access to destinations for all groups of society, and enhance the quality of life.

Increasing transportation sustainability in the United States requires policies that change travel behavior. While perhaps more difficult to achieve than improvements in technology, travel behavior change has the potential of reaping far greater and lasting sustainability gains. Germany's case may provide a helpful example. Although car use has grown in both countries, Germany has been far more successful than the United States in creating a balanced transportation system.

This report examines the applicable German transportation policies that could ultimately lead to a more sustainable U.S. transportation system. It starts with an overview of the similarities between the two nations. Next, it contrasts their degrees of transportation sustainability and explains how certain transportation and land use policies influence travel behavior. The report concludes with recommendations for future transportation policy in the United States based on this comparison.

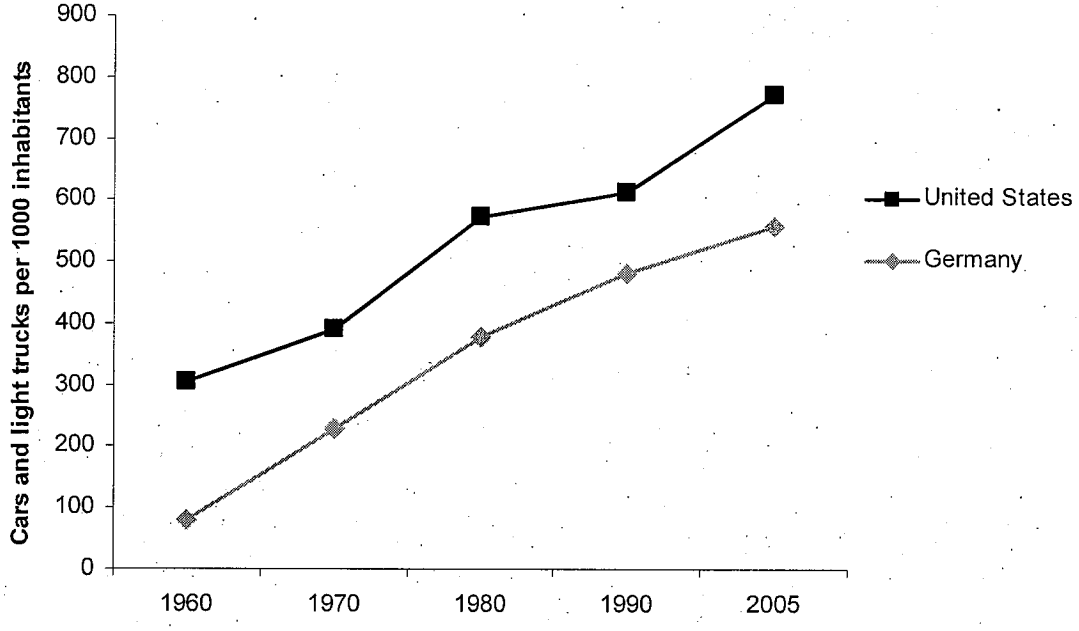
II. POLITICAL AND ECONOMIC SIMILARITIES

Germany presents a number of similarities to the United States, rendering the comparison of their transportation systems meaningful. The United States and Germany are democracies with federal systems of government, in which the interaction of national, state and local levels shapes transportation policy. Both countries have market economies with significant government involvement in the transportation sector. They are among the wealthiest countries in the world, although the United States had a higher per-capita income ($45,800) than Germany ($40,400) in 2007.[3] Both countries have extensive roadway systems; along with China's, they are the largest in the world.[4]

In terms of car ownership, Germany comes closer to the United States than almost any other country. The car ownership rate in Germany is 72 percent of the U.S. rate—560 cars versus 780 cars per 1,000 inhabitants.[5] Like Americans, most German households have a car, but Germans are less likely to own a second or third car. While the growth of the car ownership rate has slowed in Germany it has continued to rise in the United

States since 1990 (Figure 1). The status symbol of the car contributes to the high rates of car ownership in both Germany and the United States.[6]

Figure 1. Trends in Car and Light Truck Ownership per 1000 Inhabitants in Germany and the United States, 1960-2005



Sources: BMVBS 2007, FHWA 2007, Pucher and Lefevre 1996.

Both the United States and Germany have highly developed car manufacturing sectors. While General Motors, Ford, and Chrysler (the "Big Three") have been struggling lately, the German car makers BMW, Daimler, Porsche, Audi, and Volkswagen raised their market shares overseas.[7] While the global economic downturn that started in 2008 affected the entire world auto market, German manufacturers are faring better than their American counterparts.[8]

The car manufacturing and services industry is twice as important to the overall German economy (20 percent of GDP) as it is for the American economy (less than 10 percent of GDP).[9] The German lobbies for car manufacturers (German Association of the Automotive Industry - VDA) and car users (German Automobile Association -ADAC) are at least as powerful as their American counterparts—the Motor Vehicle Manufacturers Association (MVMA) and the American Automobile Association (AAA).

Although suburban sprawl is most often associated with the United States, German cities have also been decentralizing.[10] Much stricter land use controls and planning regulations have ensured a more compact pattern of metropolitan development in Germany, but the trend toward decentralization of German cities is strong.[11]

Much of the development in and around German cities is as new as that around American cities, since many German cities were almost completely destroyed in World

War II.[12] The decentralization of German cities since World War II has been fueled by rapidly increasing household incomes, soaring car ownership, and extensive road construction subsidized by the government. Current land use patterns in German metropolitan areas are not simply the result of centuries of dense development.

III. COMPARING OVERALL TRANSPORTATION SUSTAINABILITY

There is no agreement in the literature on the exact definition of sustainability. For the purpose of this report, encouraging shorter trips by non-polluting, less energy consuming and healthier modes of transportation is an essential component of a more sustainable transportation system. Moreover, a more sustainable transportation system should stimulate the economy, reduce energy consumption and the carbon footprint, increase safety, provide equal access to destinations for all groups of society, and increase the overall quality of life.[13]

Table 1. Passenger Travel and Sustainability

	United States	Germany
Car CO_2 emissions per capita, in pounds, 2005	8,600	2,900
Miles per gallon, vehicle fleet, 2005	20	30
Energy use per passenger per year, in million British thermal units (BTU), 2004-2005	55	17
Energy use per passenger mile, in British thermal units (BTU), 2004-2005		
Cars and Light Trucks Average	6,250	3,050
Transit Bus	6,850	1,700
Light Rail	4,550	2,000
Heavy Rail	4,100	2,250
Percent of household budget for transportation, 2003	19	14
Traffic fatalities per 100,000 population, 2002-2005	14.7	6.5
Cyclist fatalities per 100 million miles of cycling, 2002-2005	18.0	4.0
Pedestrian fatalities per 100 million miles of walking, 2002-2005	8.0	4.0
Car fatalities per billion miles of car travel, 2002-2005	14.4	12.5
Government transit subsidy as share of public transportation operating budgets, in percent, for all levels of government, 2006	62	26

Sources: Own calculations based on the following sources (not cited elsewhere in the text):
Association of German Transit Agencies (VDV), "VDV Statistics 2002" (2002);
German Federal Environmental Protection Agency (UBA), *Comparison of Emissions of Different Modes of Transport* (German Federal Environmental Protection Agency, 2005);
Oak Ridge National Laboratories, "Transportation Energy Data Book" (2007);

John Pucher, "Public Transportation." In Susan Hanson and Genevieve Giuliano, eds. *Geography of Urban Transportation*, (New York: Guilford Press, 2004), p. 199-236.

Even though the countries display many similarities, the transportation system is more sustainable in Germany than in the United States, judging from a range of environmental, social, and economic indicators (Table 1). Much of the difference is due to dissimilar travel behavior in the two countries, which is partly the result of different policies.

From an environmental perspective, transportation related energy use and CO_2 emissions per capita in Germany are only about a third of the U.S. rate. That is mainly explained by more car use in the United States.[14] In addition, the car and light truck fleet in the United States are 50 percent less energy efficient as in Germany. Even within the public transportation sector, German buses are four times as fuel-efficient as American buses on the basis of energy use per passenger kilometer, primarily due to more passengers per vehicle and more modern buses and trains.[15]

The transportation network is also safer in Germany. For example, total traffic fatalities per capita in the United States are 2.3 times higher.[16] The differences in traffic safety are especially striking for U.S. cyclists, whose fatality rate per mile cycled is over four times higher. Even car travel is safer in Germany, with slightly lower fatality rates per mile driven.[17] The better traffic safety in Germany is due to better and more extensive cycling and walking infrastructure, better motorist training, traffic calming of most residential neighborhoods, and traffic priority for non-motorized transportation. [18]

Better alternatives to the automobile and less car dependence also lead to greater economic sustainability of transportation in Germany. At the household level, Americans spend five percent more of their budgets on transportation, mainly related to ownership costs of multiple cars.[19] Americans spend more than Germans although Americans drive with gas sold at half the price (see Figure 3). Moreover, the public sector in Germany spends less on transportation than the United States per capita.[20] That is mostly due to the provision of less expensive walking, cycling, and public transportation facilities instead of massive roadway and parking supply, as in the United States.

These indicators show that the German passenger transportation system is more sustainable than America's. Germans use more fuel efficient cars, buses, and light rail. Consequently, they consume less fuel, spend less money on transportation, and have a smaller transportation carbon footprint. In addition, the German transportation system is safer than the U.S. system, as shown by the number of traffic fatalities per capita, per trip, and per mile traveled.

IV. KEY DIFFERENCES AND DETERMINANTS OF TRAVEL BEHAVIOR

Individuals make their daily transportation decisions based, in part, on incentives, directions, and investments established by public policy decisions. Governments influence individual travel behavior through transportation, land use, housing,

metropolitan development, and taxation policies. Other important factors influencing travel behavior include individual demographic and socioeconomic characteristics, spatial development patterns, and cultural preferences.[21] This section starts by analyzing patterns in travel behavior in Germany and the United States. Following, it presents the results of a multivariate analysis of the factors that influence travel behavior. Data employed are from the latest national travel surveys in Germany (Mobility in Germany 2002) and the United States (National Household Travel Survey 2001).[22] The Appendix presents the methodology and the statistical results.

Table 2. Differences in Travel Behavior in Germany and the United States, 2001-2002

	United States	Germany
Travel indicators		
Average number of trips per person per day	4.1	3.3
Average trip distance, in miles	9.9	6.9
Average distance traveled per person per day, in miles	40	23
Car use and ownership		
Average miles of car travel per person per year, in miles	14,900	6,800
Average vehicle miles of car travel per person per year, in miles	9,200	4,400
Percent of all trips made by car	86	61
Percent of short trips (less than a mile) made by car	67	27
Cars per 1000 inhabitants	780	560
Public transportation ridership		
Annual linked public transportation trips per capita, 2005	21	133
Percent of all trips made by transit	2	8
Non-motorized modes of transportation		
Percent of all trips made by bike	1	9
Percent of all trips made on foot	9	23

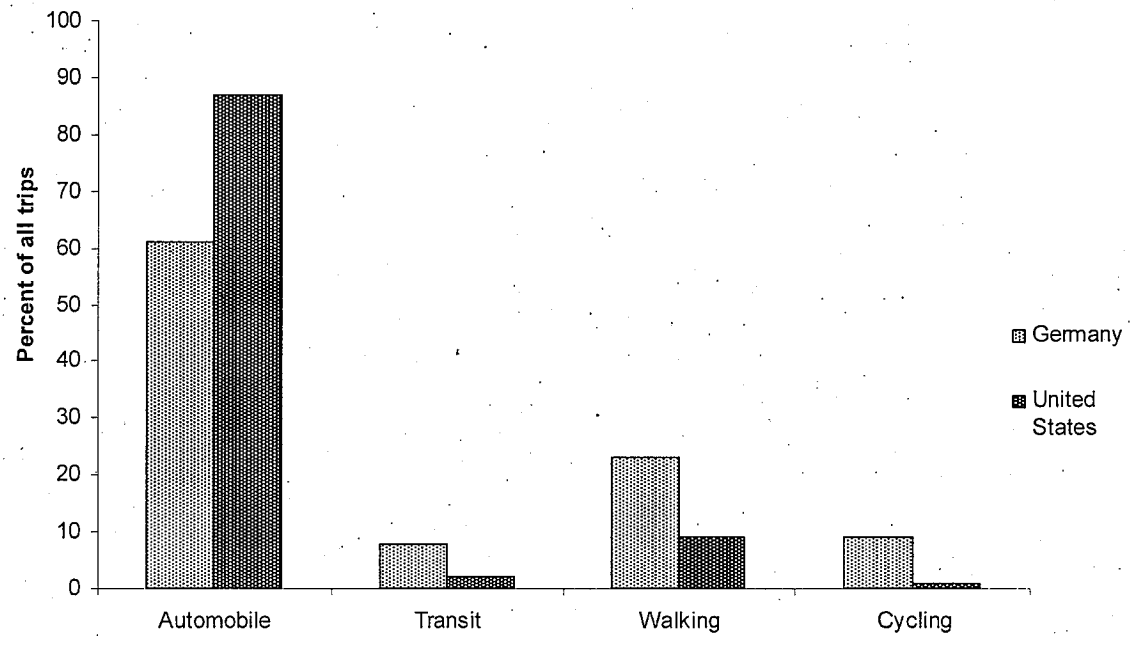
Sources: Own calculations based on the U.S. National Household Travel Survey 2001 and Mobility in Germany 2002;
American Public Transportation Association (APTA), "Transportation Factbook" (2006);
Association of German Transit Agencies (VDV), "VDV Statistics 2007" (2008).

Table 2 shows some indicators describing the travel patterns in the two countries. Americans make more and longer daily trips than Germans. As a result, they travel seventeen miles more per day as the average German. Most of the additional travel is by car (Figure 2). Overall, Americans travel by car about twice as much as Germans.

Americans are more car-dependent than Germans regardless of income level or residential density. For example, Germans in the *highest* income quartile made a smaller share of their trips by car than Americans in the *lowest* income quartile (68

percent vs. 82 percent). In addition, Germans living in low density areas traveled roughly the same as Americans living at population densities five times higher.[23]

Figure 2. Percentage of All Trips by Mode of Transportation in Germany and the United States, 2001-2002



Sources: Own calculations based on the U.S. National Household Travel Survey 2001 and Mobility in Germany 2002.

As Table 2 shows, Germans make six times as many linked public transportation trips per capita per year as Americans. That difference results from Germany's more extensive public transportation system, better intermodal connections, high frequencies of service, and more modern vehicles. In addition, Germans bike and walk more than Americans thanks to the much more extensive cycling and walking infrastructure and denser land patterns in German cities.

Our multivariate analysis presents the impact of a series of factors on German and U.S. travel behavior.[24] Travel patterns are reflected by the variables daily travel distance per inhabitant, average daily miles of car travel per inhabitant and individual choice of transportation mode. The socioeconomic and demographic factors are based on individual level data from the two national travel surveys. Spatial development variables (population density, mix of land use) and transportation policies supplement the individual characteristics. Transportation policies could not be measured directly, but were captured through policy outcome variables including:

(1) Automobile operating costs per mile as a proxy for gasoline taxation. This variable is based on local gasoline prices and fuel efficiency of the household vehicle.
(2) Household distance from public transportation, as a substitute for transit access and supply.
(3) Relative speed of a car trip vs. other modes of transportation, as a proxy for road supply, time cost, and attractiveness of public transportation versus car.

The results of our models show that transportation policies and spatial development variables each account for 25 percent of the explained variability in travel behavior, the rest being accounted by individual characteristics. Making car use more expensive reduces the distance driven in both Germany and the United States. A 10 percent increase in car operating costs is associated with a 2 percent decrease in driving distance. In addition, American drivers are more sensitive to higher car use costs than Germans. This result may be explained by the already more economical driving behavior in Germany.

In both countries, people living in denser, mixed-use developments with transit access make fewer and shorter car trips. Americans have a tendency to reduce their daily travel distance if they live in these types of areas. However, they still make most short trips by car. This higher level of car use in the United States is most likely related to lower regional population densities and limited accessibility without a car. But when transit alternatives are available, Americans are willing to drive less.

If people can travel by car faster than by public transportation, they will choose to drive. In both countries, one mile per hour increase in car speed increases the likelihood of choosing to drive by about 7 percent. Public transportation becomes attractive when driving takes a long time (in case of congestion, speed regulations, traffic calming zones). In Germany, the average car travel speed is 33 percent lower than in the United States. This lower car travel speed contributes to higher levels of public transportation use in Germany.

This multivariate analysis points towards the importance of transportation policies in shaping travel behavior. Even controlling for socio-economic and demographic factors and spatial development variables, all income groups in the United States are more car dependent than Germans. While individual characteristics matter, the incentives provided by government influence people's travel patterns.

V. PUBLIC POLICIES THAT PROMOTE SUSTAINABLE TRANSPORTATION IN GERMANY

This section focuses on five categories of government policies that have been particularly important to transportation sustainability in Germany.[25]

First, pricing, restrictions, and mandated technological improvements help mitigate the harmful impacts of car use. Second, Integration and coordination of public transportation at the regional and national levels provide a viable alternative to the car. Third, targeted regional land planning policies encourage compact, mixed-use development, and thus keep trip distances short and feasible on foot or by bike. Fourth, in addition, local and federal governments can make walking and cycling safe and convenient modes of travel. And fifth, all these policies are most effective when they are fully coordinated to ensure their mutually reinforcing impact. The analysis of this set of policies contrasts the approaches in Germany and the United States.

A. Mitigating the Harmful Impacts of Car Use

While there are clear mobility benefits that come with car use, it also produces negative effects such as traffic congestion, pollution, and diminished traffic safety. Targeted pricing and regulation policies can help manage car travel demand and reduce pollution, traffic congestion and accidents. Table 3 at the end of this section summarizes these policies, as implemented in Germany and the United States.

Costs of car use: The overall cost of owning and operating a similar car is about 50 percent higher in Germany than in the United States.[26] Most of that difference is due to much higher taxes and fees in Germany. For example, sales taxes on new cars were three times higher in Germany than in most American states in 2007.[27] Similarly, annual vehicle registration fees are generally higher in Germany, but they vary greatly in both countries.[28]

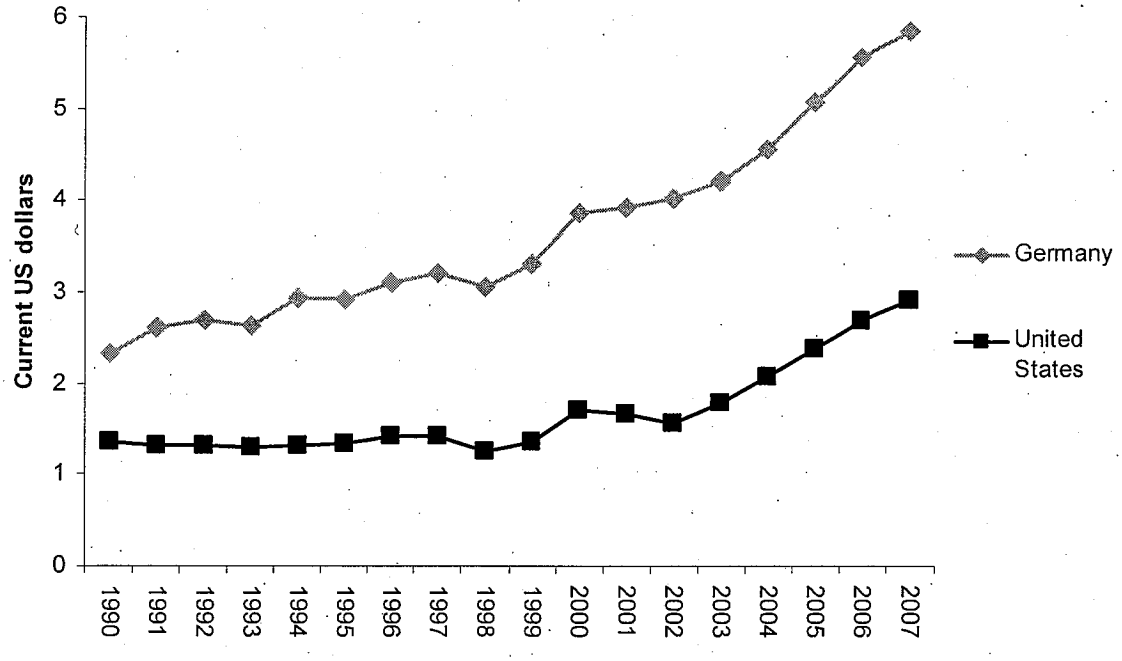
Another major difference is the cost of obtaining a driver's license. It costs an average driver-to-be roughly $2,200 to obtain a driver's license in Germany. In many U.S. states, a license can be obtained for roughly $100.[29] The higher cost in Germany is due to a mandatory minimum number of hours of driving lessons, sold by private driving schools. Many states do not require obligatory on road driving lessons to obtain a driver's license. High schools often provide driving lessons as part of their curriculum. In addition, the license fee itself is 2.5 times higher in Germany than in the United States.

Gasoline taxation also has a significant impact on costs. The fuel tax was nine times higher in Germany than in the United States in 2006 and Figure 3 shows that the gap between German and American fuel prices has increased over time.[30] While gasoline cost about 70 percent more in Germany than in the U.S. in 1990, the difference increased to 107 percent in 2006. That was partly due to an explicit policy of regular, annual increases in the gas tax in Germany between 1999 and 2003. The Green Party initiated this measure when it became part of the governing coalition in 1998.

The tax increase was explicitly designated as an environmental tax intended to curb car use and promote the purchase of more fuel-efficient cars.[31] Studies found that this five-year policy resulted in 11 percent reduction in the energy use of passenger transportation, 9 percent reduction in carbon emissions, 12 percent increase in public transportation ridership, and only 1 percent growth in vehicle miles traveled per

person.[32] Though the policy expired in 2003, the five-year implementation of the environmental tax helped boost gas taxes and prices permanently.

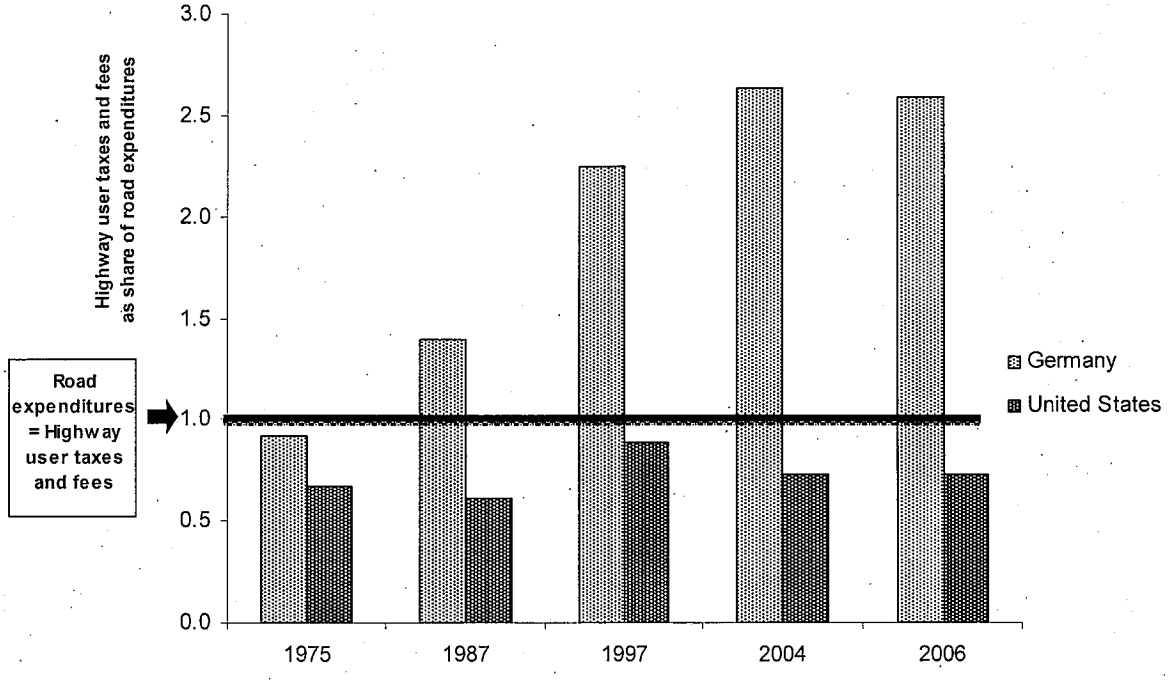
Figure 3. Trend in Gasoline Prices in the United States and Germany, 1990 – 2007 (per gallon unleaded gasoline)



Note: In current US dollars, using PPP conversion.
Sources: International Energy Agency (IEA), "Energy Prices and Taxes" (2008).

The higher cost of car use in Germany provides funding not only for highways, but also for other government spending (Figure 4). Highway user tax revenue in Germany was 2.6 times higher than government road spending in 2006. With no earmarking of taxes for transportation as in the United States, highway user tax revenue is used to finance other government projects. In contrast, highway users receive net subsidies in the United States. Indeed, fuel and other highway user taxes are not sufficient to cover government spending on roads. The federal, state and local governments in the U.S. covered only 72 percent of highways spending from highway revenues in 2006.[33] Moreover, the federal Highway Trust Fund, which receives the revenues from the federal gas tax, began running a negative balance in the fall of 2008.[34]

Figure 4. Highway User Taxes and Fees as Share of Road Expenditures by All Levels of Government in Germany and the United States



Sources: BMVBS 2007, FHWA 2007

Restrictions on car use: Compared to the United States, German cities place far more restrictions on car use in terms of road layouts, lower speeds, and less parking. Overall, the supply of roads per capita is less than half as much in Germany as in the United States.[35] In addition, there is a policy of discouraging traffic through city centers in Germany.[36] German cities create deliberate dead-ends, turn restrictions, one-way street networks, and extensive car free zones. High-speed limited access highways (Autobahns) rarely penetrate city centers in Germany as they do in most U.S. cities.[37]

Most German cities also have much lower speed limits than cities the United States. Roughly 70 to 80 percent of the German city road network has speed limits of 19 miles per hour or less.[38] Almost all residential neighborhoods employ speed-inhibiting measures, such as restrictions to 19 miles per hour signs ("Tempo 30"), road narrowing, raised intersections and crosswalks, and speed humps. Road designs such as traffic circles, extra curves, zigzag routes, and artificial dead-ends created by mid-block street closures contribute to lower car speeds. Many residential streets in Germany—both in the central city and in new suburban developments—impose even lower speed limits, requiring cars to travel at 'walking speed,' set at 4 miles per hour. Importantly, traffic calming is usually area-wide and not for isolated streets. It ensures that through -traffic

uses arterial roads designed to handle it instead of shifting traffic from one residential street to another.

Another measure discouraging car use in German cities is the high price and restricted supply of parking.[39] While 95 percent of parking in American cities is free of charge to the driver, most parking in German cities requires payment, especially in the city center.[40] Further, the supply of parking in German cities is more limited than in the United States. One study estimates that German cities have only 39 percent as many parking spaces per 1,000 jobs as American cities.[41]

Vehicle technology policy: Both the United States and Germany are world technology leaders. Higher fuel taxes in Germany, however, encourage more energy efficient cars. The German car fleet was 50 percent more fuel efficient than American cars and light trucks in 2005.[42] Over the past 15 years, the average fuel efficiency of U.S. vehicle fleet increased only slightly. On average, the cars used by Americans in 2005 were less fuel efficient than the cars driven by Germans as far back as 1980.[43]

Germany relies mainly on tax incentives to encourage the purchase and use of more fuel efficient and less polluting cars. The United States uses mainly federal standards. The high level of gas taxes is the driver of fuel efficiency technology in Germany, as throughout Europe. In addition, annual registration fees in Germany favor less polluting, more fuel efficient cars with small engines.[44] The United States provides income tax credits for hybrid and other fuel efficient cars. In addition, the United States experimented with taxes on fuel inefficient cars in the late 1970s. The "gas guzzler tax" has been paid by manufacturers of cars averaging less than 22.5 miles per gallon. However, this tax does not apply to pick-up trucks or sport utility vehicles. While successful initially, the U.S. federal Corporate Average Fuel Efficiency (CAFE) standards have remained virtually unchanged since 1985, though in December 2008 Congress approved a new fuel-economy target of 35 mpg by the year 2020.

Table 3. Policies to Mitigate the Harmful Impacts of Car Use - Measures and Indicators

	United States	Germany
Private costs of owning and operating a car		
Per mile cost of owning and operating a similar car (Honda Accord), 2006	$0.72	$1.09
Sales tax on buying a new car, 2007	~ 6 percent in most states	19 percent
Driver licensing regulation and cost, 2007	~$100 driver's licensing fee in most states	average cost $2,250 per license
	not all states mandate driving lessons	mandated on-road and in-class driving lessons
Taxes on gasoline, 2006	$ 0.42 per gallon	$ 3.6 per gallon
Share of taxes in price of a gallon of gasoline at the pump, 2006	15 percent	65 percent
Restrictions on car use		
Supply of roads per 1,000 inhabitants, 2006	13 miles	5 miles
Speed limits in cities, 2006	speed limits range from 25 to 45 mph	most German cities have traffic-calmed most of their residential streets to 19 mph
	some cities experiment with traffic calming	certain residential areas reduced car speeds to "walking speed" (4 mph)
Road layout in cities	interstate highways cut through most cities	limited-access highways are mainly outside of cities
	some cities have car-free streets (e.g. Madison (WI), Minneapolis (MN), Denver (CO) or Santa Monica (CA))	car-free zones in downtowns of most cities
		dead-ends, turn restrictions, one way street networks
Parking supply and cost	95 percent of car trips end with free parking	most cities have deliberately reduced car parking spots in downtowns and have increased fees for parking since the late 1960s
	some cities have reduced the number of car parking spots (e.g. Portland, OR) and/or charge for it	German cities have only 39 percent as many parking spots per 1,000 jobs than American cities

	California pioneered cash-out programs for employees who did not park at work	
Vehicle technology policy		
Fuel efficiency of car and light truck fleet	20 mpg (2005)	30 mpg (2005)
	16 mpg (1980)	23 mpg (1980)
Regulation of fuel efficiency	federal Corporate Average Fuel Efficiency (CAFE) standards regulate manufacturers; initially successful, but have not been renewed aggressively	high gas taxes
	gas guzzler tax	annual registration fees vary by engine size and exhaust emission
	income tax credits for hybrid and other fuel efficient cars	
Regulation of exhaust emission	EPA and state standards	increasingly strict EU wide standards for criteria pollutants
	the United States took the lead on air quality and catalytic converters since the National Environmental Policy Act (1969)and the Clean Air Act (CAA) (1970)	voluntary CO_2 emission reduction commitment by European automobile industry
	California has some of the strictest standards in the Western World; California has pioneered Low Emission Vehicle Standards (LEV) and Super Ultra-Low Emission Vehicle Standards (SULEV)	potential EU-wide regulation of CO_2 emissions is pending

Sources not cited elsewhere in the text:
Environmental Protection Agency (EPA), *Gas Guzzler Tax*, available at http://www.epa.gov/fueleconomy/guzzler/index.htm (May 2008);
Environmental Protection Agency (EPA), *On-Road Vehicles and Engines*, available at http://epa.gov/otaq/hwy.htm (May 2008);
Environmental Protection Agency (EPA), *Fuel and Fuel Additives*, available at http://epa.gov/otaq/fuels.htm (May 2008);
Pew Center on Global Climate Change, "Comparison of Passenger Vehicle Fuel Economy and Greenhouse Gas Emission Standards around the World" (Washington, D.C.: Pew Center on Global Climate Change, 2004).

B. Improving and Integrating Public Transportation Systems

The integration of different modes of public transportation at metropolitan, regional, and national levels makes public transportation convenient and attractive in Germany. This coordination includes transit services, schedules, and fares within metropolitan areas.[45] Starting with Hamburg in the 1960s, German cities created their own regional transit organizations, which fully coordinate all aspects of public transportation operations, ticketing, and fare structures.[46] Transfers between bus and rail are virtually seamless, both in terms of timing as well as distance walked.[47] German transit systems also integrate their services with walking and cycling facilities and provide extensive bike parking facilities, at suburban rail, metro stations and bus stops. [48]

This is in contrast to the rather fragmented U.S. approach. Most metropolitan areas have regional transit authorities, but with a much lower degree of coordination and integration of services than in Germany. There is little integration of timetables of suburban buses with rail transit timetables. Many transit stops are not in walking or biking friendly areas, with no sidewalks or short portions of sidewalks, particularly outside of the traditional urban cores.

The integration of transit fare structures in Germany is much better. Passengers can use one ticket for an entire trip inside a metropolitan area, regardless of how many transfers are necessary or how many transit modes used. German transit systems offer extremely deep discounts on weekly, monthly, annual, and semester tickets, making it economical and convenient to use public transit on a daily basis.[49] Compared to a single trip base fare, monthly tickets provide average discounts of 60 percent for adults and 75 percent for high school and university students.[50] In this way, public transportation becomes competitive with cars for the work commute.

In the United States, fares are rarely integrated across operators or steeply discounted with a monthly ticket. There are single ticket discounts for disadvantaged groups. All public transportation systems receiving federal subsidies are required to offer 50 percent discounts for the elderly and the disabled during non-peak travel times.[51] A 2008 survey shows that only half of transit operators offer regional monthly tickets. Most monthly tickets are limited to one particular mode or one transit provider. Savings for a typical commuter (40 trips a month) with a monthly pass for bus, light and heavy rail were between 10 percent and 20 percent compared to single trip fare cards in 2007.[52] In addition, transit riders may claim commuter federal tax benefits of up to $230 per month.[53]

Although the German transit systems offer integrated services and steep discounts, the German government actually subsidizes public transportation at a lesser degree than the United States. German public transit receives as a subsidy only 26 percent of its operating costs. In contrast, subsidies from state and local governments in the United States covered about 62 percent of operating costs in 2006.[54] Higher occupancy rates and different funding arrangements explain the discrepancy. The German public transportation system carries more than twice as many passengers per vehicle as in the

United States.[55] This generates more revenue to cover current expenses. In Germany, state governments limit their financial assistance to fare subsidies for children and the elderly. Municipal governments finance most of the transit operations.[56]

Table 4. Policies to Improve and Integrate Public Transportation Systems - Measures and Indicators

	United States	Germany
Regional integration of transit services and financing	regional transit authorities exist in almost all major metropolitan areas, but with a much lower degree of coordination and integration of services than in Germany	full coordination of operation and financing of public transportation in metropolitan areas through regional transit authorities
Multi-modal coordination	some cities integrate their bus and rail services	seamless transfers between bus and rail
	over 60 of the largest transit providers offer guaranteed-ride-home programs	integration of public transportation with walking and cycling through improvements in pedestrian and cycling facilities
	Transit Oriented Developments designed to increase walking, cycling and transit use	bike and car parking and rental programs run by transit providers
Region-wide fare integration across operators	fares are rarely integrated across operators	regional transit authorities integrate fares and time tables
	fragmented provision of transit service with little integration of timetables	state-wide time table coordination and transit tickets
Discounts	50 percent discounts for the elderly and the disabled on single tickets during non-peak travel times	many subsidized discounts for the elderly, school children, and other groups
	discount monthly tickets for commuters, but not as steep and extensive as in Germany	monthly tickets with steep discounts per trip
	federal tax benefits of up to $ 230 per month	tax benefit based on daily commute distance for all modes including transit
Unified information systems for users	fragmented information provision	users can access information about regional, state-wide, and even national transit routes, connections and fares online
	real time information remains rare even on some rail services; bus stops often even lack timetables	real time information at most rail and light rail stops and on board of most trains and buses
Bus lanes and traffic signal priority	over a dozen Bus Rapid Transit systems exist in the US	most cities have special bus lanes and traffic signal priority for buses
	HOV lanes and shoulders give buses priority over cars	

Sources not cited elsewhere in the text:
Glenn Yago, *The Decline of Transit: Urban Transportation in German and U.S. Cities, 1900-1970* (Cambridge University Press, 1984).

Public transportation is more successful in Germany not because of more subsidies, but due to much better fare and service policies, integrated systems of public transportation, and higher cost of car use. The result: Germans use transit six times more than Americans.[57]

C. Promoting Safe and Convenient Walking and Cycling

Not only do German cities provide more transit possibilities, but they are also safer for pedestrian and cyclists than in the United States. Pedestrian and cyclist fatality and injury rates in 2000 were only a third as high in Germany as in the United States.[58] Moreover, pedestrian and cyclist safety has greatly increased in Germany since 1970, compared with only modest gains in the United States. For example, the number of cyclist fatalities fell by almost 80 percent in Germany over the past 35 years, compared to a decline of only 30 percent in the United States. [59] These improvements in cyclist safety were achieved despite the cycling boom in Germany between the mid-1970s and mid-1990s, when cycling levels doubled or tripled in most cities.

Higher levels of pedestrian and cyclist safety in Germany are the result of a complete, integrated system of bicycling and walking routes, which has been developed since the 1970s.[60] This allows cyclists and pedestrians to cover almost any trip either on completely separate lanes or on lightly traveled, traffic-calmed residential streets.[61] In addition, virtually all German cities have created car-free zones in their centers, mainly intended for pedestrian use.[62] These zones are comprised of a connected network of pedestrian streets. While available in some American cities (such as Madison, WI; Minneapolis, MN; Denver, CO; or Santa Monica, CA), car-free streets are rare in the United States.

Table 5. Policies Promoting Safe and Convenient Walking and Cycling - Measures and Indicators

	United States	Germany
Federal Policies		
Federal subsidies and regulations	walking and cycling projects are eligible for federal funds	earmarked federal funds for improvement of urban pedestrian and cycling facilities
	special federal funds for non-motorized transportation	federal funding for bike paths along federal highways
	state DOTs are required to have pedestrian and cycling staff	most pedestrian and cycling infrastructure is funded locally
	every highway project must include provisions to accommodate pedestrians and cyclists	tax benefit based on daily commute distance for all modes, including walking and cycling

Pedestrian and Bicycling Friendly Facilities		
Car-free zones	no area -wide pedestrian zones; pedestrian streets exist in some cities, such as Madison (WI), Minneapolis (MN), Denver (CO) or Santa Monica (CA)	most cities have large, pedestrianized, car-free areas in downtown
Traffic calming	some cities experiment with traffic calming	almost all German cities have traffic calmed most residential streets to 19 mph
	applications are not as systematic and comprehensive as in German cities	certain areas limit cars to walking speed (4 mph)
Pedestrian facilities	lack of pedestrian facilities in many developments and along many urban roads	universal provision of sidewalks in urban areas
	urban design often caters to automobiles	well light, clearly marked zebra-crossings
	some cities experiment with pedestrian oriented design and sidewalks in all new developments	pedestrian activated crossing signals at mid-block and intersections
Bike path networks	only few cities have a network of bicycling facilities, such as Portland (OE), Davis (CA), Minneapolis (MN), Madison (WI)	a majority of cities has comprehensive, region-wide integrated networks of separate facilities for cyclists
	large cities such as New York (NY) and Chicago (IL) have plans for fully integrated networks	these networks have been promoted locally since the 1970s
		many short-cuts for cyclists and bike parking facilities
Safety, Education, and Enforcement		
Traffic education	voluntary bicycling courses	safe and effective cycling training is part of school curriculum
	rarely any education of drivers, pedestrians and cyclists about rights of pedestrians and cyclists	rights of non-motorized modes are part of driver's training and testing
	safe routes to school in all states with dedicated staff	
Enforcement of pedestrian and cyclist's rights	rarely enforced	strict enforcement through police
		special protection of children and the elderly pedestrian and cyclist's rights

Sources not cited elsewhere in the text:
Ben Hamilton-Baillie, "Home Zones - Reconciling People, Places and Transport. Study Tour of Denmark, Germany, Holland and Sweden," (February, 2006);
John Pucher, Charles Komanoff, and Paul Schimek, "Bicycling Renaissance in North America? Recent Trends and Alternative Policies to Promote Bicycling," *Transportation Research Part A* 33, (7/8) (1999): 625-54;
Thunderhead Alliance, "Bicycling and Walking in the U.S. - Benchmarking Report 2007" (2007).

D. More Mixed Land Use and Less Suburban Sprawl

Higher population density contributes to transportation sustainability. Greater mixes of land use and higher population concentrations lead to shorter average trip distances, which increase the possibilities for walking and cycling. Moreover, higher densities make public transportation service more economical and decrease average car speeds. Both Germany and the United States witnessed the decentralization of living, working and consumption over the last 50 years.[63] However, the population density over developed land area was three times greater in Germany than in the United States in 2003. This result can be explained by differences in the organization of the land-use planning process, zoning regulation, and local public finance in the two countries.[64]

The land use planning process is a coordinated interaction among all levels of government and across jurisdictions in Germany. The planning process varies across states and is organized around the principles of cooperation and mediation.[65] Municipalities contribute to plans at the regional level, regional representatives provide input into state plans, and state officials work with federal ministries in creating the federal agenda. Once plans are made, lower levels of government create their arrangements bound by the federal framework. Moreover, at each level of planning, neighboring jurisdictions are required to seek input from each other. This compels states, regions and municipalities to collaborate with their peers.[66]

The German federal government has a limited, strategic role in land use planning. It defines the legal framework for planning, ensuring the consistency of planning techniques. In collaboration with the states, it sets the broad strategic goals of spatial development, such as sustainability.[67] In terms of data and analysis, the federal government regularly publishes a report outlining trends, challenges, and projections of spatial development in Germany.

The land-use plans are developed by the lower levels of government. The lower the level of government, the more detailed the content of the plan. As in the United States, municipal governments draw the actual land-use plans. However, local plans in Germany are restricted by regional and state plans and must comply with federal laws. Further, they coordinate plans regarding transportation, electricity distribution, or sewage in the new developments.[68] New development is limited by law to areas immediately adjacent to already built-up areas, although exceptions are made on a case by case basis.[69] Even in the case of private land, developers and the municipality must convince higher levels of government to allow development of areas not abutting existing settlements. In sharp contrast to the United States, land owners cannot seek compensation if development rights are not granted.

While the federal government gets involved in the land use planning process in Germany, there are no state or federal laws requiring mixed-use zoning in either country. Consequently, municipalities have a great deal of flexibility in deciding how to zone.[70] A review of local zoning laws and regulations in Germany and in the United States shows that German single-use zoning is often more flexible than its American counterpart.[71] German single-use residential zones, for example, allow for doctor's offices, hostels, small hotels, and multi-story apartment buildings. These are generally not allowed in residential zones in the United States.

Less competition among municipalities for property taxes in Germany facilitates the cooperation and coordination of land-use planning in Germany. Property taxes provided for only 9 percent of local revenue in German municipalities compared to 35 percent for municipalities and townships in the United States in 2002. German municipalities are more dependent on intergovernmental transfers, which account for about 40 percent of local revenue, compared to 25 percent for U.S. municipalities and townships.[72] Broad-base taxes, such as the income tax and value added tax, are shared among federal, state, and local governments in Germany. These taxes are collected by the federal government and then distributed across states and municipalities based on a formula incorporating population size, economic activity, and level of public services provided locally. Besides more municipal competition for taxes, the local government system in the United States is also more fragmented with multiple special purpose governments such as school districts.[73]

The key to more dense and mixed-use settlements in Germany lies in a higher level of vertical and horizontal cooperation and interaction among jurisdictions, a strategic role of the federal government, stricter control of new developments, differences in zoning practices, and less competition for local taxes among municipalities.

Table 6. Policies that Encourage Mixed Land Use and Discourage Suburban Sprawl - Measures and Indicators

	United States	Germany
Land-use planning process	state wide planning efforts exist, such as the New Jersey State Plan and Smart Growth initiatives in states such as Maryland	reciprocal planning process with interaction of different levels of government and across jurisdictions
	every urban area larger than 50,000 population has a Metropolitan Planning Organization	integration of land use and transportation planning
		federally and state mandated planning processes and tools for regional and local land use planning
Property rights	development occurs within local zoning regulations; there are examples of local growth moratoria and growth boundaries	The possibility to develop property is restricted, especially outside of built-up areas
Zoning regulations	zoning occurs locally and can differ from municipality to municipality	zoning only within and adjacent to settlements
	there are local experiments with changes in zoning regulation such as: Transit Oriented Developments (TOD), New Urbanist Developments, or Form Based Codes	zoning regulations allow some mixed use development even in residential zones
		federally standardized and defined land use zones
Local government finance	competition for local property tax	limited competition for local property and business tax in comparison with the United States
	limited tax base sharing exists in metropolitan areas such as Minneapolis-St. Paul	broad-base taxes, such as the income tax and value added tax, are shared among all levels of government
	there are significant federal and state subsidies, however for specific investments (e.g. housing, environmental protection, and transportation)	local governments depend to a larger extent on state and federal governments than in the United States

Sources cited elsewhere in the text.

E. Coordinating the Transportation Related Policies to Ensure their Mutually Reinforcing Impact

More sustainable transportation can be achieved only if transportation-related policies are implemented in a coordinated way. It is politically difficult and potentially inequitable to restrict car use and make it more expensive unless there are feasible and convenient alternatives to car use. Thus, car-restrictive policies must be accompanied by the provision of high quality public transportation services as well as safe and convenient walking and cycling facilities.

The German experience shows a possible path towards the implementation of policies aimed at changing travel behavior. German cities started imposing restrictions on car use and parking in the 1970s. With each successive restriction, conditions for walking, bicycling, and public transportation use were improved and better integrated with each other. These improvements were popularized by extensive public awareness campaigns developed by different transportation agencies and associations (transit authorities, state and federal ministries of transportation, cycling associations).

The coordination process was developed not only among different modes of transportation, but also between transportation, other types of infrastructure, and land use policies in Germany. In most German cities, transportation and land use planning are conducted by the same local government agencies or are at least explicitly coordinated with each other. The same coordination takes place at the state and federal levels of government. For example, federal policies regarding transportation, metropolitan development, and land use planning are the responsibility of a single ministry: Federal Ministry of Transport, Building, and Urban Affairs. There is no equivalent in the United States, either at the state or federal level of government.[74]

Table 7. Coordinating Transportation Related Policies to Ensure their Mutually Reinforcing Impact- Measures and Indicators

	United States	Germany
Coordinate "carrots" and "sticks"	little coordination between policy "carrots"	coordination of policies and planning for all modes of transportation and land use
	policy "sticks" for car use are rarely used	simultaneous implementation of "stick" policies for cars and improvements of alternatives
Integrate transportation and land-use planning	MPOs serve as coordinators, but have limited implementation powers	formal links between land-use and transportation planning
		joint federal ministry for land-use and transportation planning
Campaigns, promotion, and outreach	campaigns exist, but not as extensive as in Germany	public awareness campaigns and promotion of non-automobile transportation by the national association of transit authorities, federal and state ministries of transportation, national cycling and alternative transportation associations

VI. LESSONS FOR THE UNITED STATES

U.S. transportation policy largely relies on technological solutions to improve environmental sustainability. Standards and taxes provide incentives to make cars more energy efficient, less polluting, and safer. There is little public opposition or political controversy over policies that simply provide more options and better technology without changing travel behavior.

The German experience offers five lessons to the United States on improving transportation sustainability through changes in travel behavior. While difficult to implement, the U.S. policymakers need to charge motorists a price that reflect the full cost of driving. This measure should be accompanied by integrated and convenient transit, walking, and cycling alternatives. Further, the transportation changes should be coordinated with changes in land use policies. All the adjustments need to be widely advertised and there should be a sustained campaign to educate the public about the benefits produced by the new policies. Last but not least, the policies should be implemented in a stepwise manner, with a long term perspective. These policies are inter-related; their success depends on a combined implementation over time. Some of these policies are in place already in a few states or cities in the United States. This signals that these measures are a feasible alternative for the United States, given political will and adequate planning.

1. Get the Price Right

Probably the biggest obstacle to sustainable transportation in the United States is the failure to require motorists to pay the true social, economic, and environmental costs of driving.[75] Congestion pricing, higher fuel taxes, and vehicle fees that promote higher fuel efficiency and more environmentally friendly cars are examples of such pricing policies. Charging for at least a portion of the negative externalities generated by car use would create a series of direct and indirect effects. For one, car use, and especially single-occupant car use, would fall. Recent evidence shows that a higher cost of driving, caused by the high gasoline prices over the last years, is associated with a decline in vehicle miles traveled in the United States.[76] Consumers would shift to less polluting cars and they would avoid congested areas at peak times. Moreover, new housing developments would probably be more compact and less car-dependent, with high costs of driving.

The right pricing of driving is essential to encourage more use of public transportation, walking, and cycling. The record transit ridership during 2008 in the United States emerged in an environment of high and volatile gas prices.[77] Further, these types of pricing strategies would generate revenue for badly needed investments in transportation infrastructure. In Germany, higher car use fees and taxes cover not only highway investments, but also other government spending.

2. Integrate Transit, Cycling, and Walking as Viable Alternatives to the Car
Providing safe, convenient, and cheaper alternatives to the car is necessary to make any sort of car-restrictive measures publicly and politically feasible. For example, the city of Hanover, Germany introduced an integrated mobility program in 2004. The project creates a service package of all transit services in the greater Hanover region, including taxis, car-sharing services, and rental cars. In addition, users of the program receive 25 percent discounts for long-distance rail travel in Germany and other services such as bicycle maintenance, luggage delivery, and travel information.[78]

A cheap, regionally integrated and extensive public transportation system provides a real alternative to the car. The evidence from the U.S. shows that a low-priced public transportation service alone is not sufficient to attract riders. Pricing should be coordinated over different public transportation services in order to make it more convenient for the traveler. For several decades, the German transit systems have provided regionwide monthly and annual tickets with steep discounts and further reduced fares for children and the elderly. For example, the city of Freiburg offers an annual ticket for all transit services in the region for roughly $600.[79]

3. Fully Coordinate and Integrate Planning for Land Use and Transportation
The packaging of self-reinforcing land use and transportation policies is perhaps the most important lesson that Germany can offer the United States. Transportation policies in Germany have been effective in promoting a sustainable transportation system precisely because they are integrated with land use policies aimed at discouraging car-dependent sprawl. In Germany, federal, state, and local governments participate in a top-down and bottom-up interactive planning process. At all levels of government, land-use planning is formally connected to transportation and other areas of planning.

While not coordinated, government regulation of private property and the involvement of higher levels of government in local affairs are commonplace in the United States.[80] Furthermore, federal government spending in the United States influences local policies and spatial development patterns.[81] For example, the federally-funded Interstate Highway System, federal housing, and defense spending have a large impact on municipal policies, finances, and local economic development.[82] The states and municipalities interact with the federal government in a siloed manner, dealing with each specialized federal agency separately. In addition, the federal agencies do not synchronize their strategies in response to the local partners. Formalized coordination and integration of land use and transportation planning at all levels of government can help guide transportation policy and change travel behavior.

4. Public Information and Education to Make Changes Feasible
Public information and education are crucial components of any sustainable transportation policy. Behavior-changing policies introduce costs, in financial terms or in terms of restrictions. In addition, the costs tend to be immediate while the benefits materialize over the medium or long term. Policymakers need to have an effective communication campaign that emphasizes policy benefits and the end results. Some policies might appeal to the greater good and long term societal goals, but most successful policies provide an individual short term benefit of some sort. For example,

everyone benefits from improved air quality, safer travel, and a better quality of life. A relatively immediate positive benefit might be less traffic congestion and more transit services. In Germany, the increase in the gas tax by 75 U.S. cents per gallon between 1999 and 2003 became politically acceptable only when the government promised to use the resulting revenue to lower social security taxes for all employees.

While public information may be construed as a temporary public awareness campaign, education is a permanent tool to affect behavioral change. Bicycle education for children in primary schools in Germany exposes children to traffic rules at an early age. Drivers in Germany have to learn the rights of pedestrians and cyclists as part of their driving lessons before the permit test.

5. Implement Policies in Stages with a Long Term Perspective

Changes in travel behavior do not happen overnight. The sustainable transportation and land use policies in Germany evolved over several decades. It took considerable time to gather the necessary public and political support and to develop appropriate measures. Policies were implemented initially at a small scale. Successful experiments in a few cities led to their increasing adoption in other cities and eventually nationwide. For example, regional transit organizations were introduced in Hamburg in the late 1960s and had spread to virtually all metropolitan areas throughout Germany by 1990.

Non-controversial projects should be implemented first. For example, German cities started to traffic-calm streets and neighborhoods where a majority of citizens agreed on the harmful effects of car use. The positive outcomes, such as improvements in quality of life and traffic safety, helped win public support for the extension of traffic calming schemes. All cities and villages in Germany have most of their neighborhoods traffic calmed currently.

Policies should be implemented stepwise. A phased approach and long-term view is especially necessary for controversial national policies. The environmental tax reform in Germany increased the gasoline price by 15 U.S. cents per gallon each year from 1999 to 2003. This policy was not very popular, but a phased approach made it possible to increase gasoline taxes by a total of 75 U.S. cents per gallon. A one-time gas tax hike of this magnitude would have been doomed to fail.

These policies should also be applied in a combined manner to achieve a greater synergy of their effects. As previously explained, the success of car-use pricing is dependent on the availability of safe, convenient, and cheaper alternatives to the car. The joint implementation of these policies may lead to a tipping point in travel behavior, when people may decide to walk, bike, or use transit.

VII. CONCLUSION

Different transportation policies help explain the greater sustainability of transportation in Germany versus the United States. Despite high car ownership rates, the German government made car use more expensive and less convenient than in the United States. This policy was coupled with wide ranging public transportation policies. Extensive, frequent, convenient, and attractively-priced transit services offer viable alternatives to the car in Germany. This transportation policy was implemented in concert with a supportive land use policy. Every level of government in Germany explicitly encouraged compact, mixed-use developments with first-rate facilities for walking and cycling. While each of these policies matters in isolation, combined, these policy carrots and sticks best explain the current status of the transportation system in Germany.

Far more than in Europe and Canada, public policy in America has been crisis-driven. Transportation and land use policies are no exception. Almost all policy changes towards more sustainability resulted from crises such as energy shortages, hazardous levels of air pollution, and escalating traffic fatalities. Now there is an impeding transportation funding crisis, volatile energy prices, and possible U.S. action on climate change. Additionally, the next update of the federal transportation authorization law is due in fall 2009, presenting new policy opportunities for Congress should it summon the political will.

Certainly, most Americans will not give up their cars, but they could reduce the number of trips they make. Less driving is possible if transportation policies provide safe, convenient, and practical alternatives. Even without reduced car ownership, the reduction in driving would enhance the sustainability of transportation in the United States. A more sustainable transportation system means not only greater choice of transportation services and lower household transportation expenditures, but a higher quality of life in the longer term.

NOTES

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Board Comments Home

SB 375 Cost Impacts

At the February 2-3 meeting, the board directed League staff to investigate the costs to regional planning agencies to fulfill their planning responsibilities set forth under SB 375 (chapter), and to identify possible funding sources available to help pay for these costs. The work plan for this project consisted of the following:

1. *Determine Additional MPO SCS-APS Planning Costs.* Work with California Association of Councils of Government (CALCOG) to see if they have an estimate on what new, additional costs will be involved with developing the SCS-APS.

2. *Determine New Funding Sources.* Analyze potential funding availability through Prop. 84 and SB 732; Caltrans grants for the Blueprint Network; use of new stimulus dollars; any other possible sources.

3. *Working with Other Organizations.* Work with CSAC, APA, Transportation agencies, CalLAFCO, CALCOG, builders and others to secure funding to cover additional planning costs.

The following describes the research process staff undertook to develop this information and our findings to date. Staff's work with other organizations continues.

The Research Process. Staff began this process by contacting CALCOG and a number of the metropolitan planning organizations (MPOs) to determine how far along they were in their planning process and what factors that would be appropriate to include in a survey. It became quickly apparent that most of the organizations were at the beginning stages of SB 375 planning, and had not yet developed detailed budget information.

Staff also learned that it would be difficult generally to ascertain costs because the SB 375 requirements would be interlinked with the existing forecast and (potentially) blueprint processes already being conducted by the regional MPOs.

League staff then developed a general survey that asked three questions:

1. Has your organization prepared a budget that identifies costs associated with implementing SB 375, above and beyond the costs you would otherwise incur to prepare your regional transportation plan?

2. If yes, what are these additional costs, and what assumptions did you use in arriving at this estimate?

3. What is the timeframe during which your organization would incur these additional costs?

CALCOG distributed the survey to 17 MPOs. League staff then followed up with a phone call to ensure that they had received the survey, and to answer questions about the information that the League board was requesting. During these calls staff also discussed potential cost-drivers that would be useful to include in the survey responses, such the type of planning model that would be used, and additional costs to comply with CEQA, public input requirements, or additional consultation with the state Air Resources Board.

Survey Results. At the time of this writing, the League had received information from ten of the 17 MPOs:[1] AMBAG (Monterey Bay); Metropolitan Planning Commission, Kern Council of Governments; Merced County Association of Governments; Shasta County Regional Planning Agency; Sacramento Area Council of Governments, San Diego Association of Governments, San Luis Obispo Council of Governments, Santa Barbara Council of Governments and the Southern California Association of Governments.

Each of the MPOs presented the information very differently. Some gave estimated costs of relevant planning functions; others provided narratives with very rough cost ranges. The chart below represents staff's best attempt to quantitatively reconcile this "apples and oranges" information into an aggregate cost change for each MPO (to be incurred over a period of years).

MPO	Increased Costs Related to SB 375	Comments
AMBAG	$2 million	Covers costs of AMBAG and its three county transportation planning agencies: San Benito COG, Santa Cruz RTC, and Transp. Agency of Monterey County
MTC/ABAG	$2.8 million	Includes costs for MTC and ABAG in nine county region.
Kern Co. COG	$700,000	Includes $200K for modeling consultants
Merced County	$500,000 - $1million	Does not include APS
Shasta Co.	$2.1 m.	Includes APS estimate. Also includes $285,000 to compensate member agencies for data gathering
SACOG [2]	$1 to $1.5 million	Costs significantly reduced due to prior blueprint work; staff estimates that existing blueprint as implemented will meet GhG target
SANDAG	$2.5 million	Most detailed estimates as SANDAG will be first to start process in 2011.
San Luis Obispo	No estimate yet	SB 375 does not apply to SLO's 2010 RTP; next update will be in 2014.
Santa Barbara COG	$900,000	Covers model development, data collection, public input, plan finalization
SCAG [3]	$8.85 million	SCAG predicts overall cost of $13.85 million.

1 There are actually 18 MPOs, but the 18th is in the Tahoe basin and covers only parts of El Dorado and Placer Counties in California and extends into Nevada. Due to its special nature, it was omitted from this survey.

2 The SACOG estimate is based on very rough, informal good faith estimates by the executive director that were made in terms like "low or high six figures." The figure here is League staff's attempt to present this information in a form that is similar to other estimates received; it should not be interpreted as a hard estimate.

3 The SCAG estimate also included $1.5 million for RHNA. However, the lack of funding for the RHNA process predates SB 375 and was not caused by SB 375. Thus, that figure is excluded here.

Key Survey Findings. In addition to the cost estimates, the survey revealed some additional useful information about the regional agencies' progress in this work.

- SB 375 is uncharted territory. Most regional agencies are just beginning their work. They do not have detailed plans or budgets. As a result, the estimates vary widely. For example, Shasta County estimates costs that are nearly equal to the nine-county ABAG-MTC region.

- Total costs will be spread over a two to three year planning period. In other words, funding is not a one year hit.

- Much of the new costs associated with SB 375 will be for developing modeling technology to address GhG issues, development of an SCS and APS beyond what is required under current forecasting requirements, increased CEQA analysis, and increased public participation.

- MPOs are uncertain about how to budget for the Alternative Planning Scenario (APS). For example, SANDAG assumes that the APS will be a separate process from the SCS and calculates the APS as being 80 percent of the SCS. If the SCS achieves the GhG target, or if the APS is developed in conjunction with the SCS, SANDAG's costs could be reduced by as much as $800,000. In light of the unknowns, it makes sense to budget conservatively.

- MPOs that have already worked on a regional blueprint will experience some efficiency. For example, SACOG reports that their costs for public outreach and possibly CEQA compliance will be reduced under the SB 375 process because the foundation for this work was laid during the development of the regional blueprint.

- The planning model selected will be a major cost driver. A lot will depend on the extent to which the regions will have to be able to account for savings after implementation. These costs could be more or less depending on the extent to which the state invests in modeling resources that can be accessed by all MPOs. These issues are also being discussed by the Regional Targets Advisory Committee.

- MPOs in the San Joaquin Air Basin may be at different stages in their SB 375 planning work; only two out of 8 agencies responded to the survey and we did not obtain any information on the potential costs of coordination between MPOs in this region.

Funding Opportunities. In addition to conducting the survey of regional agencies, League staff has been working with other organizations to identify possible funding sources. The problem right now is that there is not an existing funding source that is guaranteed to cover the increased costs to the MPOs associated with SB 375. However, there are a number of potential sources, some of which could be available within the next year:

- *Prop 84 Sustainable Planning Funds and SB 732 (Steinberg).* Proposition 84 included $90 million in funds for "sustainable planning." Last year, SB 732 (Steinberg), created the

Strategic Growth Council[4] to develop criteria for allocating these funds. In a letter to the Strategic Growth Council dated April 1, 2009, Senator Steinberg offers his assistance in getting these funds in "the pipeline" so that the regional MPOs can meet their statutory requirements imposed by SB 375. While not a definite source of funding, there is a good chance, that absent any other adequate funding source, some of these funds can be used to develop sustainable communities strategies and, if needed, alternative planning strategies.

- *California Regional Blueprint Planning Program.* For the past several years, Caltrans has offered blueprint planning grants through the Regional Blueprint Planning Program. A total of $5 million was made available for FY 2008-2009. As noted by SACOG's response to the survey, there can be a great deal of overlap between a blueprint and SB 375's requirements. Thus, to the extent that MPOs continue to receive some grant funds for blueprint planning, some of the SB 375 requirements, particularly those related to receiving public input on varying planning scenarios that might be included in an SCS or APS, may be underwritten.

- *RHNA Savings.* While much of the focus on SB 375 has been on increased duties related to GhG planning, each region should realize a 37.5 percent cost savings over time related to the Regional Housing Needs Assessment to the extent that the allocation will be required once every 8 years instead of once every 5 years. For example, SANDAG estimates its RHNA allocation costs at $500,000. The 8 year cycle should represent a savings of $187,500. In the SCAG region, this calculation yields a $562,500 savings.

- *Federal Transportation Reauthorization.* Though it is too early to tell what influence the new federal administration and Congress will have in this area, it is not hard to speculate that there will be more funding related to planning to minimize GhG emissions related to cars and light trucks in the next federal transportation reauthorization bill or climate change legislation in Congress. The Administration's budget overview provides calls for reforming transportation programs to "*put the system on a sustainable financing path and to make investments in a more sustainable future—enhancing transit options and making our . . . communities more livable.*" However, this conclusion is not certain, and the counter point is that the size of the deficient and the economy may caution against such a conclusion.

- *SB 406 (DeSaulnier).* This bill proposes another potential funding source: allowing MPOs to impose up to a $2 motor vehicle registration surcharge on vehicles registered in the entity's jurisdiction. Those fees could in turn be used for regional blueprint plan/sustainable communities strategy and potentially be directly available for city and county planning efforts that are consistent with a regional blueprint. The League's Transportation, Communication and Public Works Policy Committee considered this legislation at its April 3, 2009 meeting and voted to oppose the measure. Their concerns focused on the significant policy shift associated with assigning vehicle registration fee-setting authority to an MPO. The likely passage of this bill is uncertain, a similar bill was held in the Senate Local Government Committee in 2007.[5]

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[4] The Strategic Growth Council is made up of four agency heads (Governor's Office of Planning and Research, Cal EPA, , Department of Health and Human Services, and Department of Business, Transportation, and Housing) and one public member appointed by the Governor (not yet appointed).

[5] Update. On April 15, 2009, the Senate Local Government Committee voted approved this bill on a 3 to 2, party line vote.